QUARTERLY REPORT

FOR OCTOBER THROUGH DECEMBER 1994

OPERABLE UNIT 2
IM/IRA SURFACE WATER
FIELD TREATABILITY UNIT

PREPARED BY

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for the

Operable Unit No. 2 IM/IRA Field Treatability Unit

1.0 INTRODUCTION

This report covers operations at the Operable Unit Number 2 (OU-2) Field Treatability Unit (FTU) for the fourth quarter of 1994.

The FTU began operations as an Interim Measure/Interim Remedial Action (IM/IRA) under the Plan released by the Department of Energy (DOE) on May 8, 1991. The FTU began operation as Phase I for treatment of surface water from a portion of the South Walnut Creek drainage at OU-2 for removal of volatile organic compounds (VOCs) of concern. The Phase I system consisted of collection facilities at Surface Water locations SW59 and SW61, equalization tankage, bag pre-filters, Granular Activated Carbon (GAC) treatment units and insulated, heat traced transfer piping, pumps, and controls. Phase I was conducted between May 13, 1991 and April 27, 1992, at which time the Radionuclides Removal System (RRS) and collection of SW132 was implemented under the Phase II program. The RRS added provisions for treatment of radionuclides and metals by pH adjustment, chemical precipitation and cross-flow membrane filtration. The RRS replaced bag pre-filters as pretreatment to the GAC system. Detailed descriptions of the FTU and its operation can be found in the IM/IRAP(Interim Measure/Interim Remedial Action Plan), the Sampling and Analysis Plan (SAP), and related documentation. The Field Treatability Study, Phase II (March 1994) for the South Walnut Creek Basin Surface Water Interim Measure/Interim Remedial Action report contains a detailed operating history of the FTU prior to this reporting period. The Environmental Protection Agency (EPA) and Colorado Department of Public Health and the Environment (CDPHE) authorized discontinuation of collection of two of the three surface water stations, SW61 and SW132 on April 24, 1994. Collection was discontinued on May 6, 1994.

2.0 TREATMENT FACILITY PERFORMANCE

2.1 QUANTITY OF WATER TREATED

A total of 20,000 gallons of water were treated at the FTU during this reporting period.

The FTU was designed to collect surface water from three sources; SW59, SW61, and SW132. Collection occurs twenty four hours per day, 365 days per year, except for periods discussed in Section 2.7. Collected water is stored in a ten thousand gallon double walled equalization tank until enough water is present to justify initiating a batch treatment.

Collection of SW61 and SW132 was discontinued on May 6, 1994, after the EPA and CDPHE concurred with DOE's request to discontinue collection and treatment of these sources. While previous sampling has shown contamination at the two sites below Applicable or Relevant and Appropriate Requirement (ARAR) levels, the two sources will continue to be sampled to verify that no increase in contamination is present. Quarterly sample data for SW61 and SW132 will be presented in this report and future quarterly reports. Table 1 contains ARARs for the OU-2 FTU.

The significant reduction in the volume of treated water at the FTU is presented in Graph 1. Graph 1 also indicates the excess capacity available at the facility since collection and treatment of SW61 and SW132 is no longer required.

GRAPH 1

OU-2 FTU Water Treated per Month

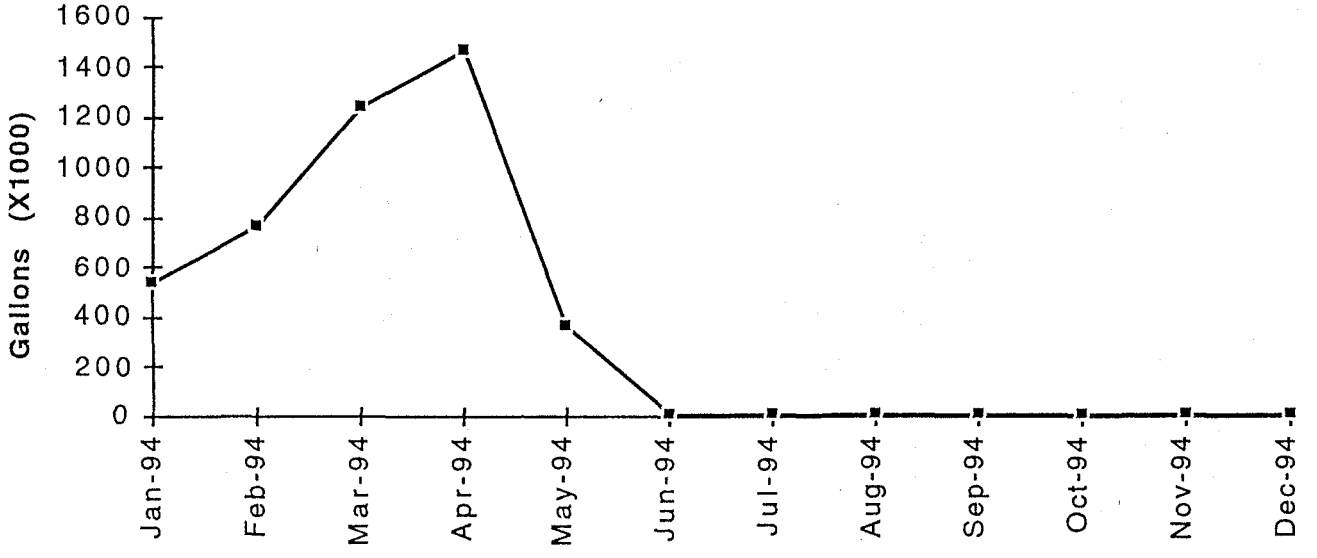


TABLE 1
Surface Water Contaminants Identified in the South Walnut Creek Basin IM/IRAP[1,2]

Analyte	Unit	Average Concentration	ARAR
Radionuclides			
Am-241	pCi/l	0.53	0.05
Gross alpha	pCi/l	730.00	11.00
Gross beta	pCi/l	545.00	19.00
PU-239/240	pCi/l	3.28	0.05
U-total	pCi/l	11.69	10.00
VOCs[3]			
1,1-Dichloroethene	µg/l	142	7.00
Carbon Tetrachloride	µg/l	219	5.00
Chloroform	µg/l	82	1.00
Tetrachloroethene	µg/l	279	1.00
Trichloroethene	µg/l	153	5.00
Vinyl Chloride	µg/l	-	2.00
Metals-Dissolved			
Iron	µg/l	-	300.00
Manganese	µg/l	0.5790	50.00
Metals-Total			
Aluminum	µg/l	25.1214	200.00
Arsenic	µg/l	-	50.00
Barium	µg/l	1.8530	1,000.
Beryllium	µg/l	0.0519	100.00
Cadmium	µg/l	0.0132	5.00
Chromium	µg/l	0.1918	10.00
Copper	µg/l	0.2664	25.00
Iron	µg/l	183.964	1,000.
Lead	µg/l	0.1954	5.00
Manganese	µg/l	3.3068	1,000.
Mercury	µg/l	0.0022	0.20
Nickel	µg/l	0.2239	40.00
Selenium	µg/l	0.0070	10.00
Zinc	µg/l	1.3475	50.00

[1] From the IM/IRAP (DOE, 1991).
[2] Only analytes with ARARs are presented.
[3] Analyzed by EPA Method 524.2.
- Not calculated in the IM/IRAP.

The volume of water collected for treatment during this reporting period was as follows:

Month	Total Gallons	Gallons/Day	Gallons/Minute
October	8,480	274	0.19
November	4,530	151	0.10
December	6,990	225	0.16

2.2 CHEMICAL USAGE

Chemical usage at the FTU was as follows:

Month	Sulfuric Acid	Calcium Hydroxide	Ferric Sulfate	Hydrogen Peroxide	Sodium Hydroxide
October	0 gal	22.5 lbs	0 lbs	15 gal	0 gal
November	0 gal	22.5 lbs	0 lbs	0 gal	0 gal
December	0 gal	0 lbs	0 lbs	10 gal	0 gal

Note: Several chemicals are recorded as 0 gallons or pounds due to the small volume of water processed. These chemicals were used at normal concentrations, but preparation of chemical solutions for treatment was not required during the month.

2.3 WASTE GENERATION

No waste was packaged during this reporting quarter. A small amount of sludge was generated as a result of treating the 20,000 gallons of water, however it was not enough to require waste packaging during this reporting period.

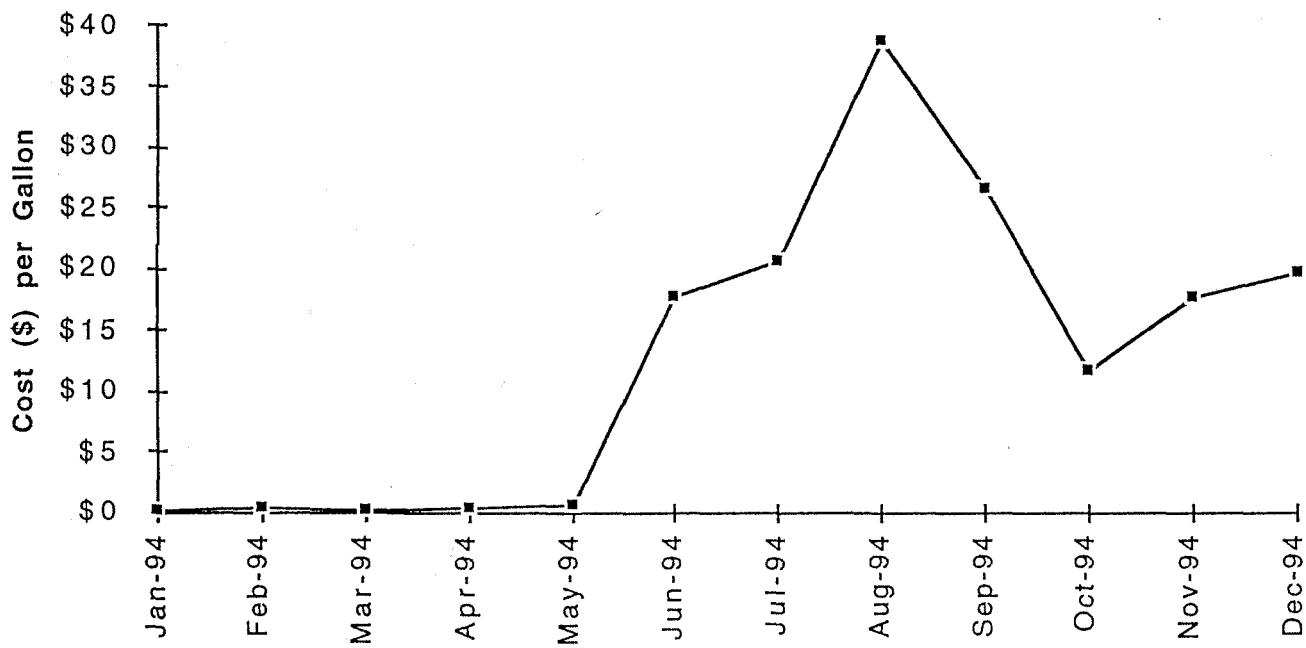
One 55-gallon bag of used Personnel Protective Equipment (PPE) was generated during this quarter. The PPE is monitored for contaminants, and if determined clean for unrestricted release, sent to the Rocky Flats Plant Landfill for disposal. To date, no PPE has been found to be contaminated.

2.4 OPERATING COSTS

The reduced volume of water that is collected and treated at the FTU has resulted in cost savings for sampling and chemical supplies. Modifications to reduce the subcontract started soon after collection and treatment of SW61 and SW132 was discontinued, and was fully implemented in early October, 1994. The cost/gallon of treated water at the FTU is presented in Graph 2, below. These costs include subcontract labor and operations costs, capital improvements (permanent power installation), Plant Support, and Project Management. A significant increase in treatment costs/gallon of treated water can be attributed to the reduction in treated water.

GRAPH 2

OU-2 FTU Cost/Gallon for Treated Water



The large increase in treatment cost can be attributed to the reduction of SW61 and SW132. Operations at the FTU have been cut back as much as possible (operations have been reduced from 24 hour/day, 7 days/week, to a 40 hour week), however, the cost/gallon to treat water cannot be reduced to the higher volume treatment costs. Monitoring of the tanks and piping that contain the untreated water cannot be eliminated, and preventive maintenance must be

performed in order to keep the facility operational. Project Management has been reduced by approximately 70% to help reduce operations costs.

Monthly operating costs for *subcontractor labor and supplies* (including chemicals) were as follows:

October:	$30,193
November:	$30,585
December:	$23,784

Total monthly operating costs (burdened support labor, subcontract costs, equipment, and sampling) for the FTU are presented below:

October:	$100,000
November:	$80,000
December:	$137,000

The burdened monthly cost variations can be attributed to sampling. Samples taken late in the month will increase costs for the next month due to the delayed sampling billing cycle.

The increased cost per gallon rate (only treating SW59) at the OU-2 FTU justifies treating the water in a different manner. EG&G Rocky Flats Inc. has proposed to consolidate the OU-2 FTU and OU-1's Building 891 water treatment facilities. Discontinuation of collection and treatment of the 881 Footing Drain has been approved, providing OU-1 with excess capacity and increased treatment costs similar to that of the FTU. By consolidating the two facilities, treatment costs will be reduced, and secondary waste production will be minimized. Any additional sources of water (non-RCRA) that can be treated at the new facility will help reduce the cost/gallon to treat the water. Consolidation of the two facilities is underway (planning), with an estimated completion date of late July, 1995. Preliminary data indicates that the consolidated facility will reduce OU-1 and OU-2 water treatment costs by $1.2 million per year, and allow for treatment of OU-7 seep water at a minimal cost.

2.5 POWER

Permanent overhead power replaced diesel power generation on July 8, 1994.

Backup power is provided to the FTU from a portable diesel generator that is wired into the power grid through a transfer switch. In the event of a power failure, the diesel generator will provide 100% of the power required to operate the facility.

2.6 PREVENTIVE MAINTENANCE

During this reporting period a rigorous preventive maintenance program monitored all process equipment at the FTU. All process equipment at the FTU has been characterized and evaluated for

preventive maintenance frequency, spare parts requirements, and impacts on the system from individual equipment failure. A preventive maintenance computer program tracks all planned maintenance activities and helps to assure that all equipment is properly maintained.

All corrective and preventive maintenance items were completed on schedule.

2.7 PERIODS OF NON-COLLECTION

Periods of non-collection are periods when the collection weir pumps cannot collect surface water (up to 60 gallons per minute) and transfer it to the equalization tank for storage and later treatment.

No periods of non-collection have occurred since collection of SW-61 and SW-132 was discontinued on May 6, 1994.

3.0 SAMPLING

3.1 SAMPLING OBJECTIVES

Sampling at the FTU is performed to characterize the influent surface water, wastes, and effluent water, and to optimize FTU operations to minimize chemical consumption and waste generation. The IM/IRA identified specific contaminants of concern and established possible chemical-specific ARARs as effluent standards for discharge of the treated water (ref. Table 1, page 5).

Sample results contained in this report are unvalidated, and are presented to provide a general scope of the contaminants treated at the facility. Additionally, radionuclide data turnaround time is significantly longer than that of VOC or metals. All available data for the reporting quarter is presented below.

Unvalidated sample results showing contaminants exceeding ARARs for this quarter are presented below, as well as contaminants not associated with ARARs that are present in the water stream above detection levels.

Due to the decrease in the volume of collected and treated water, sampling at the FTU has been reduced significantly.

Surface Water Division continues to characterize the three sampling locations (SW59, SW61, and SW132) associated with the FTU. Analytical results will be presented in quarterly reports for the facility.

3.2.1 UNTREATED INFLUENT WATER FROM SW59

SW59 VOCs (August - November 1994)

Chemical	Units	High	Average[1]	ARAR
1,1-Dichloroethane	ug/L	1	0.87	None
1,1-Dichloroethene	ug/L	3	1.87	7
1,1,1-Trichloroethane	ug/L	6	3.93	None
Carbon Tetrachloride	ug/L	120	73.8	.5
Chloroform	ug/L	24	15.9	1
Methylene Chloride	ug/L	14	1.16	None
Tetrachloroethene	ug/L	39	26.1	1
Trichloroethene	ug/L	44	28.7	5
cis-1,2-Dichloroethene	ug/L	48	33.6	None
Vinyl Chloride	ug/L	8	1.13	2

[1] Average value calculated by taking all values (for non-detect, 1/2 the detection limit was used) and dividing by the number of samples.

SW59 Metals (August - November 1994)

Metal	Units	High	Average[1]	ARAR
Aluminum	ug/L	13,400	2,152	200
Iron	ug/L	19,900	1,886	1,000
Lead	ug/L	31.6	5.8	5
Manganese	ug/L	2,100	306	1,000
Zinc	ug/L	1020	364	50

[1] Average value calculated by taking all values (for non-detect, 1/2 the detection limit was used) and dividing by the number of samples.

SW59 Radionuclides

Radionuclide data for August, September, and October of 1994 show no ARAR exceedences at this sampling location.

3.2.2 SURFACE WATER LOCATION SW61

SW61 VOCs (August - November 1994)

Tetrachloroethene exceeded its associated ARAR of 1 ug/L during three separate sampling events, with a high of 6 ug/L, and an average value of 1.03 ug/L.

SW61 Metals (August - November 1994)

Metal	Units	High	Average[1]	ARAR
Aluminum	ug/L	864	216	200
Cadmium	ug/L	14.8	6.65	5
Iron	ug/L	1,180	130	1,000
Zinc	ug/L	168	43	50

[1] Average value calculated by taking all values (for non-detect, 1/2 the detection limit was used) and dividing by the number of samples.

SW61 Radionuclides

Radionuclide data for August, September, and October of 1994 show no ARAR exceedences at this sampling location.

3.2.3 SURFACE WATER LOCATION SW132

SW132 VOCs (August - November 1994)

Volatile Organic Compound data for August, September,October, and November of 1994 show no ARAR exceedences at sampling location SW132.

SW132 Radionuclides

A Gross Beta value of 21 pCi/L +/- 1.5 pCi/L (ARAR = 19 pCi/L) was recorded on September 8, 1994. This was the only radionuclide ARAR that was exceeded during the months of August, September, and October of 1994.

SW132 Metals (August - November 1994)

Metal	Units	High	Average[1]	ARAR
Aluminum	ug/L	864	216	200
Chromium	ug/L	10.9	Only one detect	10
Iron	ug/L	1,060	191	1,000
Zinc	ug/L	648	108	50

3.3 RS-5 (TREATED EFFLUENT FROM CHEMICAL PRECIPITATION/MICROFILTRATION PRIOR TO GAC)

Due to the low volume of treated water, no samples were collected from this location.

3.4 RS-6 (LEAD GAC EFFLUENT)

Due to the low volume of treated water, no samples were collected from this location.

3.5 RS-7 (TREATED EFFLUENT)

One sample was taken (October 11, 1994) for this reporting period.

Aluminum was detected at 319 ug/L. The OU-2 FTU ARAR for aluminum is 200 ug/L.

No radionuclides or VOCs exceeded ARARs at RS-7 during this quarter.

3.6 RS-8 (SLUDGE)

No sludge was packaged during this reporting period, therefore no samples were collected.

4.0 OPERATIONS SUMMARY

Collection and treatment of SW-59 water continued without incident.

Sampling and characterization of SW-59, SW-61, and SW-132 continues.

5.0 ENVIRONMENTAL COMPLIANCE

No spills or releases to the atmosphere, secondary containment, or environment occurred during this reporting period.

6.0 REPORTS/CORRESPONDENCE

During this reporting period no significant reports and/or documents that pertained to the OU-2 FTU were generated.

7.0 ANTICIPATED OPERATIONS FOR NEXT QUARTER

Normal operations are expected to continue next quarter, with no expected shutdowns or periods of non-collection.

Extracted groundwater from the Soil Vapor Extraction project may be treated at the FTU.

Modifications will be made to the sampling and analysis plan for the FTU. A net reduction in samples, along with onsite analysis of other samples will result in a significant cost savings.

Purge water collected from contaminated wells may be treated at the FTU. All purge water will be sampled to determine the best facility to treat the water. Possibilities for treatment include the OU-1 IM/IRA (Bldg. 891), OU-2 IM/IRA FTU, 374 Evaporator, and the Sewage Treatment Plant. Each facility is limited by certain contaminants, so sampling will determine the final destination.

Phase II spent GAC will be sent offsite for reactivation.

Offsite shipment of mixed waste sludge generated during operation of the FTU will begin next quarter. The sludge will be shipped to Envirocare, a licensed mixed waste repository located in Utah. A total of 318 drums of sludge have been generated during operation of the FTU.

Work will continue for consolidation of the OU-1 and OU-2 FTU water treatment facilities.

Sludge drums will be inspected and prepared for offsite disposal at Envirocare, a permitted low-level mixed waste disposal facility in Utah.

Sampling and characterization of SW59, SW61, and SW132 will continue.

A double walled storage tank will be installed adjacent to SW59 to allow for storage of water during periods when the site is unattended, and to allow for tanker transfer activities when SW59 is transferred to the consolidated treatment facility for treatment.

8.0 SUMMARY/CONCLUSIONS

The OU-2 FTU continues to collect and treat contaminated surface water from SW59 24-hours per day, 365-days per year.

In order to reduce operating costs and provide additional treatment for most all environmental wastewaters, the OU-1 and OU-2 treatment equipment will be consolidated at Building 891. The design for this project is underway, with an expected project completion date of late July, 1995.